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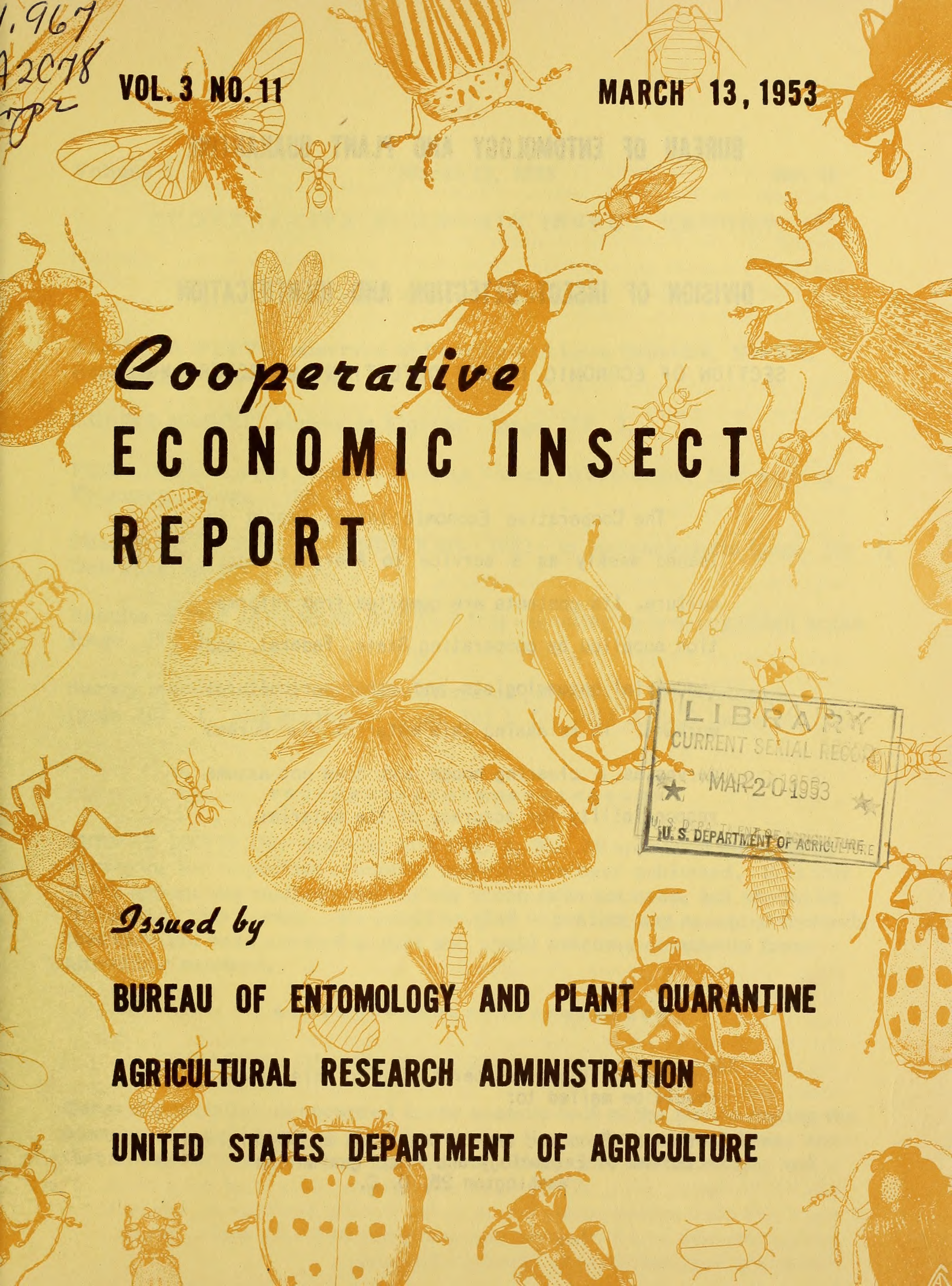

Cooperative
ECONOMIC INSECT REPORT

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DIVISION OF INSECT DETECTION AND IDENTIFICATION

SECTION OF ECONOMIC INSECT DETECTION AND REPORTING

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Bureau serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 3 March 13, 1953 No. 11

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

ALFALFA WEEVIL observed in Douglas and Lyon Counties, Nevada, February 19 (page 169).

LUPINE MAGGOT survey in Florida (page 169).

PEAR PSYLLA eggs found in Yakima Valley, Washington, last week of February (page 169).

SUMMARY OF INSECT CONDITIONS - 1952 - in Massachusetts (page 172), Delaware (page 174).

Results of 1952 JAPANESE BEETLE trap-scouting in non-regulated areas (page 178).

Survey methods for APHID populations on potatoes in the Northeast (page 181), and Northwest (page 182), for PEA APHID (page 183).

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SURVEY METHODS: Starting with Vol. 2, No. 25 approved methods of surveying for important economic insects have been published. It is felt there are survey methods now in use which have not been, but should be included in this series. We would be glad to publish any accepted methods that have not been carried to date and would welcome comments from any of our readers.

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WHEATHER OF THE WEEK ENDING MARCH 10, 1953

General precipitation occurred in the eastern half of the Nation during the passage of a cold front on the 3d and 4th. Heavy snows fell in Iowa, northern Missouri, and eastern portions of Kansas and South Dakota, and lighter snow with some drifting farther north. Heavy rains fell from Tennessee to the Great Lakes, and some flooding was reported in Indiana. Precipitation was heavy enough in Missouri to penetrate the subsoil for the first time in many months. From the Mississippi Valley eastward, except near the Gulf much soil was too wet to work. Although the subsoil is still dry, surface moisture conditions in Oklahoma are the best in months, ponds are beginning to fill, and the season's first runoff was reported.

Light to occasionally moderate snows were frequent in the northeastern quarter throughout the period. Snowfall during the passage of a southward moving cold front east of the Rocky Mountains on the 7th left the ground covered in central and northern portions of Illinois, Indiana, and Ohio, most of Pennsylvania, Maryland, Delaware, and New Jersey, south-central New York, and northern Virginia to depths ranging from 1 to 3 inches at lower levels and up to 10 inches in the mountains. Roads were slick and numerous traffic accidents occurred. Most of this snowcover soon melted in Indiana, Ohio and southern Michigan, but remained on the ground until the end of the period in Pennsylvania and surrounding areas. In the lower Great Plains on the 8th and 9th light to heavy rains fell in Texas and light to moderate rains as far west as eastern Arizona. These rains were heavy in most of the northern and western plateau regions of Texas where droughty conditions have prevailed for the past several months. In the northern Great Plains, the far West, along the Gulf Coast, and in Florida precipitation was very light, with most of the Great Basin of the far West and parts of Florida receiving none. Except in Florida where topsoil was quite dry, rainfall was not needed in most of the South, since the soil in many sections had been too wet to work.

The week was unseasonably cold in the northeastern quarter of the country, and especially in the Midwest where the ground was snow-covered during a part of the week. At Dubuque, Iowa, and Moline, Ill., snow covered the ground throughout the week, and temperatures averaged 10 degrees below normal. Temperatures fell to subzero levels in the northern Great Plains and upper Mississippi Valley on the 6th and 7th. On the 6th Glasgow, Mont., recorded -14 degrees and Bismarck, N. Dak., -16 degrees; on the 7th Duluth, Minn., reported a low of -17 degrees and Grantsburg, Wis., -24 degrees. In the deep South temperatures generally averaged above normal, with the plus departures ranging up to 6 degrees at Miami, Fla., No freezes occurred in most sections, although minima in the Southeast dropped into the 30's to extreme southernGeorgia on the 5th and 6th (Atlanta, Ga., 32 degrees) and again at the end of the period. The week was also unseasonably warm in the Pacific Northwest, where the weekly average was 10 degrees above normal at Walla Walla, Wash. (Summary Supplied by U.S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GRASSHOPPERS (Acrididae) - ARIZONA - *Melanoplus mexicanus* began hatching in alfalfa fields in Salt River Valley, Maricopa County about February 15. This hatch was confined to exposed light sandy soil and should not at this time be considered general throughout the valley. (Schmitt and Dutton).

ALFALFA WEEVIL (*Hypera postica*) - NEVADA - Larvae reported from Douglas and Lyon Counties February 12. Adults observed in these areas February 19. (G. G. Schweis).

PEA APHID (*Macrosiphum pisi*) - IDAHO - Examination of alfalfa in the Wawawai and Snake River Canyons February 25 showed the alfalfa about 1 1/2 inches above ground surface. Hand sampling failed to show any infestation and in 100 sweeps with a collecting net only 1 pea aphid was found. (H. C. Manis).

LUPINE MAGGOT (*Hylemya lupini*) - FLORIDA - A survey conducted to determine the limits of this insect in Florida shows that it is present from Santa Rosa County on the west to Levy County on the south. The insect occurs in all but a few of the lupine-growing counties in the State. (F. E. Guthrie).

A MITE ON OATS (*Penthaleus major*) - MISSISSIPPI - Specimens from small but damaging infestation in a planting of oats in Washington County submitted by E. W. Dunnam February 2, 1953.

FRUIT INSECTS

PEAR PSYLLA (*Psylla pyricola*) - WASHINGTON - Eggs found in the Yakima Valley during the last week of February. It appears that the season is about three weeks earlier than usual. (E. J. Newcomer).

TRUCK CROP INSECTS

PEA APHID (Macrosiphum pisi) - CALIFORNIA - A 40-acre pea field heavily infested in Ventura County, February 27. (R. E. Campbell).

PEA WEEVIL (Bruchus pisorum) - IDAHO - Information on the abundance of pea weevils in the fall of 1952 indicates that an increased number of pea weevils as compared to 1951 went into hibernation. The mild winter weather should not cause much mortality and the trend of increasing weevil migration into fields in the Palouse area can be expected to continue in 1953. (H. C. Manis).

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - VIRGINIA - Larvae continue to infest crucifers in the Norfolk area. (Brubaker, Greenwood, Hofmaster). FLORIDA - Continues abundant on turnips and Chinese cabbage in Gadsden and adjacent counties. Tobacco plant beds infested in some instances. (L. M. May).

ONION THRIPS (Thrips tabaci) - TEXAS - Found in sufficient numbers to warrant insecticidal control in the Winter Haven area. (B.H. Richardson).

APHIDS (Aphidae) - VIRGINIA - Colonies of cabbage aphid (Brevicoryne brassicae) beginning to build up on seed stalks of over wintering crucifers in the Norfolk area. Both this species and green peach aphid (Myzus persicae) lightly infest most cole crop plantings. Several growers applying insecticides for green peach aphid on spinach. (Brubaker, Greenwood, Hofmaster). SOUTH CAROLINA - Cabbage aphid remains generally light on cabbage in Charleston area but apparently increasing. Turnip aphid (Rhopalosiphum pseudobrassicae) infestations on spring cabbage have diminished and most plantings seem out of danger of serious injury by this aphid. (W. J. Reid). TEXAS - Turnip aphids found in damaging numbers on mustard near Winter Haven. (B. H. Richardson).

CABBAGE CATERPILLARS, including imported cabbageworm (Pieris rapae) and cabbage looper (Trichoplusia ni), are generally abundant on cabbage in Gadsden County, FLORIDA area. (L. M. May).

SPIDER MITES - Populations on strawberries in Norfolk area can become injurious if conditions are favorable and if no insecticidal measures are used. (Brubaker, Greenwood, Hofmaster).

COTTON INSECTS

CUTWORMS (Phalaenidae) - TEXAS - Damaging seedling cotton throughout the Lower Rio Grande Valley. (R. D. Griffith).

INSECTS AFFECTING MAN & ANIMALS

CATTLE GRUBS (Hypoderma sp.) - UTAH - Have been increasing in cattle during the past two weeks in most parts of the State. In some localities few had appeared until well into February. (G.F. Knowlton, March 4).

FOREST INSECTS

BLACK TURNPENTINE BEETLE (Dendroctonus terebrans) - GEORGIA - Serious damage to pine trees in 2 square mile area in Coffee County, February 19. (Faircloth and Torrance).

NANTUCKET PINE MOTH (Rhyacionia frustrana) - GEORGIA - Causing injury to 5 acres of loblolly pine in Jefferson County. (W. M. Fortson).

MISCELLANEOUS INSECTS

CLOVER MITE (Bryobia praetiosa) - NEVADA - Considerable control necessary in Reno vicinity, where mites have invaded homes. (G. G. Schweis). TENNESSEE - Invading homes in the Clarksville area. (L. B. Scott).

SUMMARY OF INSECT CONDITIONS - 1952

MASSACHUSETTS

Reported by A. I. Bourne

Cereal and Forage Insects: EUROPEAN CORN BORER (Pyrausta nubilalis) was somewhat more serious than in 1951 and caused more trouble to many growers than usual. SPITTLE BUGS were found generally abundant in most alfalfa fields throughout the Connecticut Valley area, but abundant rainfall in May counteracted most of the feeding and for the most part damage was not serious. TARNISHED PLANT BUG and other LYGUS BUGS were generally abundant in alfalfa, but did not seriously damage the first cutting. A LEAFHOPPER attack on alfalfa developed in mid-summer and together with hot weather and light rainfall caused much yellowing of late stands. STALK BORER (Papaipema nebris) - Several outbreaks of a serious nature occurred in eastern Massachusetts. This pest was much more abundant than usual on corn, tomatoes and potatoes through early July in western Massachusetts. JAPANESE BEETLE (Popillia japonica) was very abundant in infested areas throughout the State. The beetles seriously attacked many corn fields, feeding on young silks and preventing development of ears.

Vegetable Insects: CUTWORMS were generally abundant through May to mid-June. Some instances of serious damage in strawberry plantings in Cape Cod area in late May. APHIDS were very abundant on most crops subject to attack and on some which are seldom seriously infested. Infestation persisted throughout the summer. TOMATO RUSSET MITE (Vasates destructor) found in greenhouses in Foxboro in late June. Believed to be the first report of this species in Massachusetts.

Pests of Shade Trees and Ornamentals: EASTERN TENT CATERPILLAR (Malacosoma americanum) was very abundant throughout the State Heaviest attack in several years. Wild cherry trees and miscellaneous brushy growth along highways were completely defoliated. As many as 15-20 "tents" per trees were frequently found. APHIDS were unusually abundant over the State. SPRUCE MITES were very abundant from early May to mid-June. Became abundant again in mid-July and caused considerable bronzing. SPIDER MITES (Tetranychus *bimaculatus* and *T. canadensis*) caused bronzing of elms in many cases following DDT applications in mid-summer. WILLOW MITE (*Schizotetranychus schizopus*) found abundant in several areas in western Massachusetts. Caused severe bronzing in many cases in mid-summer. IMPORTED JAPANESE WEEVIL (*Calomycterus setarius*) was reported from both eastern and western areas. Large numbers caused annoyance around homes in several instances. JAPANESE BEETLE - Heavy feeding reported on many types of foliage. In western Massachusetts beetles of this species overlapped ROSE CHAFER (*Macrodactylus subspinosus*) attack by about 10 days. The combined attack was serious on favored hosts of both species. OAK TWIG PRUNER was somewhat more conspicuous than for the last few years. GYPSY MOTH (*Porthetria dispar*) - Hundreds of acres of woodland damaged and in many areas completely defoliated along the summits and upper slopes of hills in Franklin, Hampshire Counties and parts of Berkshire County. BIRCH LEAF MINER (*Fenusa pusilla*) was very abundant throughout eastern areas; moderate in western areas. ELM LEAF BEETLE (*Galerucella xanthomalaena*) was somewhat generally more abundant than usual. CANKERWORMS were more abundant than usual in eastern areas in late May. FOREST TENT CATERPILLAR (*Malacosoma disstria*) reported very general and abundant in the Blue Hills Reservation south of Boston. Abundance about normal elsewhere. MANTIDS were much more numerous in both eastern and western areas than in any single season in recent years. A serious outbreak of an ERIOPHYID MITE (*Acaphylla steinwedeni*) was discovered on leaves of camellias in two large commercial greenhouses in Connecticut Valley area. So far as can be learned this is the first record of occurrence of this species in this area. When attack was discovered severe bronzing of lower leaf surface had occurred and numerous mites were found on both leaf surfaces, along petioles, and bark of twigs. EARWIGS occurred in unusually large numbers, especially from eastern and southeastern Massachusetts and along the North Shore up to Gloucester. Infestations spreading westward from Boston area. OLD HOUSE BORER (*Hylotrupes bajulus*) - Heavy emergence from historic relocated buildings in July in "Storrowtown", West Springfield.

DELAWARE

Reported by H. E. Milliron

Corn Insects: EUROPEAN CORN BORER (Pyrausta nubilalis) - Very heavy population and damage occurred in the southern section of the State, where from 50 to 75 per cent pupation was observed as early as April 24. Injury to both field and sweet corn was severe from Dover southward by June 26; less conspicuous, northward. Sweet corn in the proximity of Ellendale and Dover was heavily infested, August 7. The fall field-corn survey indicated a state-average of 134 borers per 100 stalks, almost double that of 1951, with the greatest concentration of borers in Sussex County. ARMYWORM (Pseudaletia unipuncta) - Common on forage crops in late May and early June; a few invaded cornfields near Dover, Thompsonville, Harrington, Bridgeville and Laurel. CORN EARWORM (Heliothis armigera) - Abundant throughout the State; severe early injury was observed in the areas surrounding Magnolia, Bridgeville and Bethel, July 3; canning corn was affected generally. BLACK CUTWORM (Agrotis ypsilon) - Caused serious damage to young plantings in Kent and Sussex Counties in late June, necessitating much replanting; on July 10, very heavy loss was reported near Thompsonville. A CORN SAP BEETLE (Carpophilus lugubris) - Infested ears of sweet corn throughout the State by July 24; considerable loss was apparent, especially in southern Kent and in Sussex County during August; numerous adults and larvae were present in ears of field corn in September. JAPANESE BEETLE (Popillia japonica) - Fed on silks at numerous locations throughout July; less abundant than in 1951. CORN LEAF APHID (Aphis maidis) - Injurious numbers were present August 7 at Milford, Lincoln and Georgetown on both field and sweet corn. GRASSHOPPERS (Melanoplus differentialis and Melanoplus spp.) - Invaded fields from adjacent grasslands in large numbers at several locations in Kent and Sussex Counties during July; responsible for heavy marginal damage at Rising Sun, August 21.

Alfalfa and Clover Insects: SPITTLEBUGS (Philaenus leucopthalmus and Philaenus spp.) - Nymphs very prevalent and injurious generally during May. POTATO LEAFHOPPER (Empoasca fabae) - Caused much discoloration of alfalfa near Greenwood, south of Milford and elsewhere in June. PEA APHID (Macrosiphum pisi) - Unusually abundant on alfalfa and clovers in Sussex County, and on alfalfa near Smyrna; both quantity and quality of the first cutting were materially reduced at several localities. A beneficial fungus was effective in reducing the population at many places by the end of May. GREEN CLOVERWORM (Plathypena scabra) - More common than usual, particularly on alfalfa in Kent County; adults were commonly observed by mid-July. ALFALFA WEEVIL (Hypera postica)- A new and potentially serious pest in the State; the first adult was found on April 17 at Greenwood on alfalfa; by May 22, the distribution was known to be statewide. Several heavily damaged alfalfa fields were found on May 8 near Adamsville; most severe injury during the season was confined to that general area, a location south of Milford, another east of Lincoln and one near Smyrna.

Fruit Insects: CODLING MOTH (Carpocapsa pomonella) - Damage was not unusually heavy; partial third brood developed in late August. RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) - Third brood was active at Rising Sun prior to harvest. APHIDS - Populations were not unusually destructive this season. JAPANESE BEETLE - Apple foliage was attacked in some plantings during the first week of July. PLUM CURCULIO (Conotrachelus nenuphar) - Injury was largely restricted to untreated or abandoned orchards. PEACH TREE BORER (Sanninoidea exitiosa) - Moderately heavy infestation occurred near Georgetown. SPITTLE BUGS - Very numerous early in the season in most strawberry plantings about Greenwood, Bridgeville and elsewhere. STRAWBERRY WEEVIL (Anthonomus signatus) - Damage was about equal to that of the preceding season.

Vegetable Insects (see also under corn): MEXICAN BEAN BEETLE (Epilachna varivestis)- Extensive damage was done to all types of beans from May through July; present in about normal numbers. BEAN LEAF BEETLE (Cerotoma trifurcata) - Somewhat less abundant than in the preceding season; concentrated mostly on green beans. BEAN APHID (Aphis fabae) - Small colonies on limas discovered July 17 near Milton; numerous threatening infestations occurred in late July in Sussex County, accounting for heavy losses. Activity continued on this crop at many points in the southern half of the State until mid-August, later in the vicinity of Laurel.

POTATO LEAFHOPPER - Unusually abundant on all beans from Milford southward, June - August. Considerable injury to potatoes, accompanied by tip-burn, occurred in Kent County during June. GREEN CLOVERWORM - Required additional control operations in several large lima plantings in the vicinities of Bridgville and Laurel. SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata howardi) - Adults were unusually common on all beans in June and July; in late-August, numerous instances of severe injury by the larvae to lower stems and roots of limas were found throughout Sussex County. COLORADO POTATO BEETLE (*Leptinotarsa decemlineata*) - Unusually abundant on and destructive to tomatoes during the entire season; less injurious to potatoes generally than in the preceding year. TOBACCO HORNWORM (*Protoparce sexta*) - First generation was not a problem on tomatoes, except at few locations in Sussex County; in August, the second generation was responsible for much feeding in the southern half of the State. It was the only important leaf-feeder on peppers during July and August, when noticeable damage was recorded at many localities between Milford and Bridgeville. TOMATO FRUITWORM (*Heliothis armigera*) - Caused appreciable damage to fruits at Ellendale, and some leaf and stem injury at Little Creek and Bridgville. POTATO and TOBACCO FLEA BEETLES (*Epitrix cucumeris* and *E. hirtipennis*) - More common than usual in May on all untreated potato plantings. EUROPEAN CORN BORER - Occurred commonly in potato vines at Newark, Ellendale, Bridgeville and elsewhere, causing some breakage and lodging. A FLEA BEETLE (*Phyllotreta* sp.) - Injurious activity was restricted to young cabbage and broccoli plants from Milford southward, but continued to attack kale throughout the season at many places. A SMALL STEEL-BLUE WEEVIL (*Ceutorhynchus erysimi*) - Occurred in numbers on kale near Georgetown. IMPORTED CABBAGEWORM (*Pieris rapae*) - Was present generally, but less numerous and destructive than in 1951. APHIDS - Were not a serious problem. CABBAGE LOOPER (*Trichoplusia ni*) - Most abundant and damaging pest of cole crops generally; additional insecticide treatments were necessary on large broccoli plantings at Wyoming, Milford and Milton because of its presence. DIAMONDBACK MOTH (*Plutella maculipennis*) - Population was about normal on all preferred cole crops. PEA APHID - Moderate to heavy populations developed on peas only at Brenford, Magnolia, Milton and Bridgeville. BLACK CUTWORM - Caused severe losses in some pepper plantings in western Sussex County in late-June. HORNED SQUASH BUG (*Anasa armigera*) - Was less prevalent than in 1951, but about as numerous as the SQUASH BUG (*A. tristis*) - throughout Sussex County during June, July and August; both species severely damaged squash and pumpkin-squash at several places in August. SQUASH VINE BORER (*Melittia cucurbitae*) - Infested a large proportion of these crops from Milford southward. SQUASH BEETLE (*Epilachna borealis*) - Very abundant and injurious to numerous large plantings of pumpkin-squash in Sussex County, after having been relatively inactive for about twenty years. MELON APHID (*Aphis gossypii*) - Moderately heavy infestations were found on watermelons at Felton. SWEETPOTATO FLEA BEETLE (Chaetocnema confinis) - Congregated in large numbers on young vines at Ellendale, Millsboro, Bethel and elsewhere; much injury resulted and plant growth was impaired.

Ornamental and Shade Tree Insects: A JAPANESE WEEVIL (Pseudocneorhinus bifasciatus) - Active on a variety of ornamentals at Seaford in August. AZALEA BARK SCALE (Eriococcus azaleae) - Caused some damage at Wilmington. EUROPEAN CORN BORER - Infested dahlias at Ellendale. BAGWORM (Thyridopteryx ephemeraeformis) - Completely defoliated cedars at Wyoming, a nd was plentiful on sycamore north of Harrington. MIMOSA WEBWORM (Homodaula albizziae) - Attack on mimosa was severe in July in Kent and Sussex Counties; many honey locusts also were seriously injured in New Castle County. JAPANESE BEETLE - Fed on elm, in particular, at numerous locations in Kent County.

Results of 1952 Japanese Beetle Trap-Scouting in Non-regulated Areas

Summarized by T. C. Cronin

During 1952 some scout-trapping for the Japanese beetle was scheduled in all non-quarantined states except Idaho, Nevada and North Dakota. The non-regulated portions of regulated quarantined states were also scouted. Important military and commercial airfields, motor and rail freight and passenger terminals, golf courses, parks, nurseries and greenhouses were among the sites checked. Most of the work was in the eastern half of the country with the greatest concentration in sections closest to regulated areas, but 162 places were scout trapped in California. More than 1600 localities in 39 states are recorded as having been scouted, but there were hundreds of additional unrecorded localities scattered in all non-quarantined states where there was scouting for the beetle by other workers incidental to their regular field assignments.

One or more beetles were reported from 117 localities. Thirty-five of these places, including 3 first-record locations, are in 10 non-quarantined states. The remaining 82, including 25 first-records, are in the 6 quarantined states now partially under regulation. The survey did not disclose beetle infestation in any state where it had not been known to exist previously, however, one beetle was trapped at each Maxwell Airforce Base, Montgomery, Ala., and Kelly Field, San Antonio, Texas for first-record beetle collections in Texas and Alabama. These two records, with those at Drew Field, Tampa, Florida; Naval Air Base, Glenview, Illinois; and municipal airport, Florence, S. C. this year, probably indicate airplane hitchhiking beetles, like the few which had been captured at other airports in recent years, rather than beetle establishment. Intensive scouting is planned during the 1953 adult beetle period in the vicinity of each airfield where there was a trap collection this year.

In 1952 the only beetle reported west of St. Louis, Missouri was the one from Kelly Field, San Antonio, Texas. Retrapping and intensive scouting near the Los Angeles, California airport showed negative results where one beetle was trapped in 1951 and soil treatment was applied.

Metropolitan St. Louis showed a total of 15 beetles.

No beetles were reported from the non-quarantined Southern States except collections at the Tampa, Fla.; Montgomery, Ala.; and Florence, S. C. airfields, and in Georgia. There were no new collection locations in Georgia, and the situation at Dahlonega and the Atlanta area was about the same as in 1951. Austell showed 67 beetles, Marietta 1, and Toccoa 49 beetles.

Scouting in Illinois showed more beetles than previously in the East St. Louis area, 56 in Chicago, 7 at Cicero, 4 each at Decatur and Evanston, one at Glenview and one at Highland Park. Beetles were taken in 5 places in Indiana, as follows: Elkhart, 69; Ft. Wayne, 252; Logansport, 46; Terre Haute, 362; and there was a considerable reduction at South Bend where an established infestation had been discovered and treated in 1951; however, Indiana State regulatory measures invoked last year at South Bend remain in effect. In Michigan there were collections in the Detroit area totalling 68 beetles; 17 at Grand Rapids and 1 each at Wyandotte, Kalamazoo and Flint.

More than one-half of the total localities recorded as having been scout-trapped were in the non-regulated sections of the 9 states partially regulated by State-Federal Japanese beetle quarantines. No beetles were reported from non-regulated sections of Maine, New Hampshire and Vermont. In New York, where there was extension of Federal regulated area in 1951, beetles were collected at 10 of the 204 places scouted. Numerous beetles were taken at Sodus Point and Letchworth State Park, and there were 176 trapped at Geneva and 58 each at Newark and North Rose. From 1 to 11 beetles were trapped at the remaining 5 places. Scattered beetle finds were recorded in 11 communities in the non-regulated section of Pennsylvania. More than 400 places were scouted in Ohio, and results were positive in 34 localities. In Virginia beetles were reported from 7 of the 82 places scouted this year. Scouting this year in West Virginia showed beetles in 4 first-record places. Small numbers of beetles were taken at 3 of these, and numerous beetles were collected in Dunbar. One hundred forty-one localities in North Carolina were scouted, and results were positive in 11.

In Kentucky scouting showed numerous beetles in Louisville and Russell; 97 beetles in Bellevue, a few beetles in four neighboring communities and 1 in Bromley.

SURVEY METHODS

APHID POPULATIONS ON POTATOES IN THE NORTHEAST

Populations of aphids in northeastern Maine are determined at intervals on potatoes receiving no insecticidal treatment and on potatoes treated commercially for the control of insects. In this area the potato plants usually are infested by winged and wingless forms of four species of aphids (buckthorn, green peach, potato, and foxglove aphids). The wingless forms -- ordinarily by far the more numerous on the plants -- cause direct feeding damage to the potato plants and also serve as vectors for certain virus diseases of potato. The winged forms are often of more importance than the wingless forms in spreading the virus diseases within and between fields of potatoes, and they also colonize plants in widely separated parts of the field. One species of aphid may be of greater importance than another as a vector of certain of the virus diseases and, because of size differences, in causing direct feeding damage to the potato plants. Therefore, in all aphid population counts, a record form is used to show the number of each species found on each sample unit.

Number and location of sample units: Experience has shown that it is not practical to determine aphid populations in an entire potato field. Consequently, the sample units are limited to one square acre in each field of commercially-grown potatoes examined. One hundred sample plants are located mechanically at random over the acre by a screen-grid method.

Unit and sub-units of sample: 1/ Early in the season, when plants and aphid populations are small, the entire hill is examined. After the plants are about 8 inches high the examinations are confined to 3 leaves on each sample plant. The leaves are examined in situ, care being taken not to disturb the aphids. One leaf is located at random within each of the top, middle, and bottom thirds of the plant. Later, if larger numbers of aphids develop, only the terminal and the 2 basal (lateral) leaflets of each leaf in each of the 3 standard positions are examined. Typically, potato leaves have 7 leaflets -- a terminal and 3 pairs of laterals. If still later even larger

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1/ Abstracted from pages 9-10 of Bul. 480, Maine Agr. Exp. Sta., "Control of Aphids on Potatoes with DDT when Used with Fungicides," by W. A. Shands, G. W. Simpson, P. M. Lombard, R. M. Cobb and P. H. Lung.

numbers of aphids develop, the sub-units consist of only half the area of these 3 leaflets in similar positions. All the leaf area on one side of a midrib of a leaflet constitutes a half leaflet. Detailed studies have shown that this is a valid sampling procedure. These half-leaflets are chosen so that 50 percent of them are on one side of the leaflet midrib and the rest on the other. For any one sample plant, however, the same side of the midrib for all 9 of the half leaflets is used.

Expressing aphid populations: Populations are stated in terms of the average number of aphids of each species per plant. Winged and wingless forms are recorded separately. Except when the entire hill is used as the unit of sample early in the season, the number of aphids determined as the average is the average of those found on 3 whole leaves per plant. When the sub-unit consists of leaflets 1, 4, and 7, the 3-whole-leaf basis is approximated by dividing the average (for the 1-4-7-leaflet basis) by 38.1 and multiplying by 100. This formula was derived from a study of aphid distribution on potato leaves. Likewise, the 3-whole-leaf basis is approximated for counts involving sub-units of one-half of leaflets 1, 4, and 7 by using 19.05 as the factor instead of 38.1.

Information from surveys following this procedure permits comparisons between aphid populations at different locations as well as between the populations of the four species of aphids involved. Because of differences in growth habits of different potato varieties, population comparisons between varieties and between years may be of less value. When made at regular intervals throughout the season in the same locations the counts indicate locality differences in rates of population increase. Actual aphid populations per plant -- when sub-units of sample are involved -- can be approximated by multiplying the averages for the 3-whole-leaf basis by one-third of the average number of leaves per stalk and that by the average number of stalks per hill. (W. A. Shands and G. W. Simpson).

APHID POPULATIONS ON POTATOES IN THE NORTHWEST

Only the green peach aphid (Myzus persicae) occurs in sufficient numbers to cause direct feeding damage to potatoes in the intermountain area of the Northwest. The extent of overwintering is indicated by the number of eggs found per six inches of twig in 25-twig samples taken from each of four peach orchards in February. At this time the location of 100 eggs is marked on the trees and the start of hatching and 50 and 100 percent of hatch is determined by examining those eggs every two weeks.

The start of aphid flight in the spring, and the seasonal intensity of flight from May to October, is determined from twice-weekly examinations of four, or more, Moericke-type traps which are placed at ground level near potato fields. This trap consists of an aluminum stew pan 8 inches wide and 2 1/2 inches high. Chrome-yellow enamel paint is applied to the inside of the pan to within one inch of the top. A quart of water in each pan serves as a trapping medium. The aphids are removed for identification and counting by pouring the water through a fine-mesh wire-screen funnel.

Starting when the potato plants are four inches high, and continuing at approximately 14-day intervals until the early crop is harvested or the late-crop plants are frosted, 50 compound leaves are picked at random - one leaf per plant - from the base of the plant in four fields of approximately the same planting age. Three categories of aphid abundance are obtained from the trap or leaf-sample examinations.

Classification	Number of winged aphids per trap (3-4 day collection)	Number of wingless aphids per 50 compound leaves of potato
Light	0 - 10	0 - 50
Moderate	11 - 100	51 - 500
Heavy	101 - 1000 plus	501 - 2000 plus

(B. J. Landis, E. W. Davis and K. E. Gibson)

PEA APHID (Macrosiphum pisi)

Three methods are commonly used in measuring pea aphid populations, the choice of method depending upon the host plants and size of the aphid population.

Sweepnet counts: The sweep net is used in very low aphid populations, such as occur in alfalfa late in the summer, or in peas just after the spring movement from alfalfa. A standard 15-inch collecting net is used, and a brisk sweep of about 3/4 of a circle is taken. (Two sets of samples are taken in representative parts of each field.) In taking a series of sweeps, the operator moves forward one or two steps at each sweep, to encounter previously undisturbed foliage. A few exploratory sweeps are taken to determine the size of sample. In general, a sufficient number of sweeps should be taken to collect from 50 to 100 aphids, but in very low populations this may not be possible, and under these conditions a sample of 25 or 50 sweeps should be taken.

Board Counts: These are used in general survey work, on moderate to high populations of pea aphids. The board is a thin piece of board about 10 x 18 inches in size, containing an area 6 x 12 inches that is marked off into smaller squares. The board is held below and to one side of the tips of a row of pea plants, and the aphids on the plants dislodged by shaking the plants with the free hand. Only the aphids which fall inside the marked portion of the board are counted. In very high populations, the aphids are counted only on alternate squares, in checkerboard fashion. Ten randomly distributed board samples are taken from each field or station.

Tip Counts: This type of count is used in general survey work on moderate to high populations. The operator walks across the field holding an open paper sack in one hand and picking tips at random with the other hand. The tips are from 4 to 6 inches long, and are picked with a twisting motion of the hand so that the tip, when severed, is held over the open palm, to catch any aphids that may be dislodged. The tips are dropped into the paper bag, which is then closed and stapled, and taken to the laboratory for counting. At the laboratory the bags are placed in a large container and fumigated with a few cc. of methyl-iso-butyl ketone for about 10 minutes. This makes the aphids loosen their hold on the plants. The contents of the bags are then shaken over a 4-mesh screen so that the aphids drop through and the plants remain. Flat black or white boards may be used to catch the aphids for counting. As with the sweepnet, the number of tips per sample is varied with the aphid population. Two 50-tip samples are needed for populations much lower than 1 aphid per tip, while two 5- or 10-tip samples is sufficient for aphid populations higher than 10 per tip. It is generally difficult to count more than 300 to 500 aphids per sample, and the number of tips per sample should be reduced in high populations to give about this total number of aphids.

Correlation of Methods: Because of the varying conditions under which the above methods are used ordinarily, a close correlation is not possible. However, in general on alfalfa a population of 1 aphid per tip is about equal to 30 aphids per sweep. On peas, a population of 1 aphid per tip is about equal to 3 to 4 aphids per board or per sweep. (W.C.Cook)

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